IN THE CLAIMS:

The following is a complete list of the claims. This listing replaces all earlier versions and listings of the claims.

Claims 1-40 (canceled)

Claim 41 (new): A gradation conversion method for a radiation image photographed by a radiation photographing apparatus, said method comprising the steps of:

extracting a subject from the radiation image;

changing pixel values constructing the subject;

obtaining added values by adding, in one direction, the changed pixel values;

determining coordinates in the subject based on the added values;

calculating a statistic from the pixel values within a certain range in the image including the coordinates;

forming a gradation conversion curve based on the statistic; and

converting the radiation image by using the gradation conversion curve formed.

Claim 42 (new): A method according to Claim 41, wherein said subject extracting step includes calculating a representative value representative of a passing through area in the image, and deleting, from the image, pixels equal to or exceeding the representative value and pixels within a certain distance from the pixels.

Claim 43 (new): A method according to Claim 41 or 42, wherein said changing step includes counting the total number of pixels included in an area linearly extending from one contour line of the subject to the other contour line of the subject in the one direction, and dividing the pixel values included in the linearly extending area by the corresponding total number counted in said counting sub-step.

Claim 44 (new): A method according to Claim 43, wherein said coordinate determining step is executed to determine the coordinates in the subject from the coordinates of the pixels used for calculating an added value indicative of the maximum value.

Claim 45 (new): A method according to Claim 41 or 42, wherein said changing step is executed to change the pixels to have a certain value.

Claim 46 (new): A method according to Claim 45, wherein said coordinate determining step is executed to determine the coordinates in the subject from the coordinates of the pixels used for calculating an added value indicative of the minimum value.

Claim 47 (new): A method according to Claim 41 or 42, wherein said changing step is executed to change the pixel values based on either each pixel value or the coordinates of each pixel.

Claim 48 (new): A method according to Claim 47, wherein said coordinate determining step is executed to determine the coordinate in the subject from the coordinates of the pixel values used for calculating an added value indicative of the maximum value or the minimum value.

Claim 49 (new): A method according to Claim 41, further comprising:

causing an X-ray irradiating unit to irradiate the subject; and

converting radiation passed the subject into a radiation image by a two-dimensional sensor.

Claim 50 (new): A method according to Claim 41, wherein the statistic is an intermediate value or a mean value.

Claim 51 (new): A program which is used to execute a gradation conversion method for a radiation image photographed by a radiation photographing apparatus, said method comprising the steps of:

extracting a subject from the radiation image;

changing pixel values constructing the subject;

obtaining added values by adding, in one direction, the changed pixel values;

determining coordinates in the subject based on the added values;

calculating a statistic from the pixel values within a certain range in the image including the coordinates;

forming a gradation conversion curve based on the statistic; and

converting the radiation image by using the gradation conversion curve formed.

Claim 52 (new): A computer-readable storage medium which stores a program to execute a gradation conversion method for a radiation image photographed by a radiation photographing apparatus, said method comprising the steps of:

extracting a subject from the radiation image;

changing pixel values constructing the subject;

obtaining added values by adding, in one direction, the changed pixel values;

determining coordinates in the subject based on the added values;

calculating a statistic from the pixel values within a certain range in the image including the coordinates;

forming a gradation conversion curve based on the statistic; and

converting the radiation image by using the gradation conversion curve formed.

Claim 53 (new): A radiation photographing apparatus having a gradation conversion function, said apparatus comprising:

an X-ray irradiating unit for irradiating;

a two-dimensional sensor for converting radiation irradiated by the X-ray irradiating unit into a radiation image signal;

a subject extracting unit for extracting a subject from a radiation image represented by the radiation image signal;

a changing unit for changing pixel values constructing the subject;

an adding unit for obtaining added values by adding, in one direction, the changed pixel values;

a coordinate determining unit for determining coordinates in the subject based on the added values;

a calculating unit for calculating a statistic from the pixel values within a certain range in the image including the coordinates;

a curve forming step of forming a gradation conversion curve based on the statistic; and

a gradation converting unit for converting the radiation image by using the gradation conversion curve formed.

Claim 54 (new): A radiation photographing apparatus having a gradation conversion function, said apparatus comprising:

an X-ray irradiating circuit for irradiating;

a two-dimensional sensor for converting radiation irradiated by the X-ray irradiating circuit into a radiation image signal;

a passing through deleting circuit for calculating a value representative of a passing through area in a radiation image represented by the radiation image signal, and extracting a subject by subtracting pixels equal to or exceeding the representative value and pixels within a certain distance from the pixels;

a projection preparing circuit for calculating the total number of the pixels included in an area linearly extending from one contour line of the subject to the other contour line of the subject in one direction, dividing the pixel values included in the linearly extending area by the corresponding total number, and obtaining added values by adding the divided pixel values in one direction;

a projection analyzing circuit for determining coordinates in the subject from coordinates of the pixel values used for calculating an added value indicative of the maximum value in the added values; and

a gradation conversion processing circuit for calculating a statistic from the pixel values within a certain range in the image including the coordinates, forming a gradation conversion curve based on the statistic, and converting the radiation image by using the gradation conversion curve.

01 concluded